

Overview

Useful For

Confirmation of suspected clinical diagnosis of Li-Fraumeni syndrome or Li-Fraumeni-like syndrome

Identification of familial *TP53* mutation to allow for predictive testing in family members

Genetics Test Information

This test evaluates for the presence of germline *TP53* mutations associated with Li Fraumeni syndrome. For patients with a history of hematologic malignancy and/or bone marrow transplant, consultation with the laboratory is required prior to submitting a specimen.

Additional Tests

Test ID	Reporting Name	Available Separately	Always Performed
COLAB	Hereditary Colon Cancer CGH Array	Yes, (order FMTT)	Yes

Testing Algorithm

When this test is ordered, comparative genomic hybridization array will always be performed at an additional charge.

See [TP53 Mutation Testing Analysis](#) in Special Instructions.

Special Instructions

- [Molecular Genetics: Inherited Cancer Syndromes Patient Information](#)
- [Informed Consent for Genetic Testing](#)
- [TP53 Mutation Testing Algorithm](#)
- [Informed Consent for Genetic Testing \(Spanish\)](#)

Method Name

Polymerase Chain Reaction (PCR) Amplification followed by DNA Sequencing and Gene Dosage Analysis by Array Comparative Genomic Hybridization (aCGH)

NY State Available

Yes

Specimen

Specimen Type

Varies

Advisory Information

This test is **not** appropriate for evaluation of somatic *TP53* mutations. To evaluate for the presence of somatic *TP53* mutations for diagnostic or prognostic purposes in patients with chronic lymphocytic leukemia, see P53CA / Hematologic Neoplasms, *TP53* Somatic Mutation, DNA Sequencing Exons 4-9.

Shipping Instructions

Specimen preferred to arrive within 96 hours of draw.

Specimen Required

Patient Preparation: A previous bone marrow transplant from an allogenic donor will interfere with testing. Call 800-533-1710 for instructions for testing patients who have received a bone marrow transplant.

Specimen Type: Whole blood

Container/Tube:

Preferred: Lavender top (EDTA) or yellow top (ACD)

Acceptable: Any anticoagulant

Specimen Volume: 3 mL

Collection Instructions:

1. Invert several times to mix blood.
2. Send specimen in original tube.

Forms

[1. New York Clients-Informed consent is required.](#) Document on the request form or electronic order that a copy is on file. The following documents are available in Special Instructions:

-[Informed Consent for Genetic Testing](#) (T576)

-[Informed Consent for Genetic Testing-Spanish](#) (T826)

2. [Molecular Genetics: Inherited Cancer Syndromes Patient Information](#) (T519) in Special Instructions

Specimen Minimum Volume

1 mL

Reject Due To

All specimens will be evaluated by Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Ambient (preferred)		
	Frozen		
	Refrigerated		

Clinical and Interpretive

Clinical Information

Li-Fraumeni syndrome (LFS) is a rare autosomal dominant hereditary cancer syndrome associated with germline mutations in the *TP53* (also *p53*) gene. LFS is predominantly characterized by sarcoma (osteogenic, chondrosarcoma, rhabdomyosarcoma), young-onset breast cancer, brain cancer (glioblastoma), hematopoietic malignancies, and adrenocortical carcinoma in affected individuals. LFS is highly penetrant; the risk for developing an invasive cancer is 50% by age 30 and 90% by age 70 with many individuals developing multiple primary cancers. Childhood cancers are also frequently observed and typically include soft-tissue sarcomas, adrenocortical tumors, and brain cancer. Other reported malignancies include melanoma, Wilms tumor, kidney tumors, gonadal germ cell tumor, pancreatic cancer, gastric cancer, choroid plexus cancer, colorectal cancer, prostate cancer, endometrial cancer, esophageal cancer, lung cancer, ovarian cancer, and thyroid cancer.

There are published criteria for the use in establishing a clinical diagnosis of classic Li-Fraumeni syndrome and Li-Fraumeni-like (LFL) syndrome that include the above features listed. A larger percentage of families that meet the classic LFS criteria, are predicted to have a detectable mutation within the *TP53* gene than families that meet the less strict LFL criteria (Birch's and Eeles' definitions).

Reference Values

An interpretive report will be provided.

Interpretation

All detected alterations are evaluated according to American College of Medical Genetics recommendations.(1) Variants are classified based on known, predicted, or possible pathogenicity and reported with interpretive comments detailing their potential or known significance.

Cautions

Some individuals who have a diagnosis of Li-Fraumeni syndrome or Li-Fraumeni-like syndrome may have a mutation that is not identified by this method (eg, deep intronic mutations, promoter mutations). The absence of a mutation, therefore, does not eliminate the possibility of a diagnosis of Li-Fraumeni syndrome or Li-Fraumeni-like syndrome. For predictive testing of asymptomatic individuals, it is important to first document the presence of a *TP53* gene mutation in an affected family member.

In some cases, DNA alterations of undetermined significance may be identified.

We strongly recommend that asymptomatic patients undergoing predictive testing receive genetic counseling both prior to testing and after results are available.

Predictive testing of an asymptomatic child is not recommended.

Rare polymorphisms exist that could lead to false-negative or false-positive results. If results obtained do not match the clinical findings, additional testing should be considered.

Test results should be interpreted in the context of clinical findings, family history, and other laboratory data. Errors in our interpretation of results may occur if information given is inaccurate or incomplete.

Clinical Reference

1. Richards S, Aziz N, Bale S, et al: Standards and guidelines for the interpretation of sequence variants: a joint consensus recommendation of the American College of Medical Genetics and Genomics and the Association for Molecular Pathology. *Genet Med* 2015 May;17(5):405-424
2. Lindor NM, McMaster ML, Lindor CJ, et al: Concise handbook of familial cancer susceptibility syndromes - second edition. *J Natl Cancer Inst Monogr* 2008;(38):1-93
3. Masciari S, Syngal S: The role of p53 in colorectal cancer. In *Genetics of Colorectal Cancer*. Edited by JD Potter,

NM Lindor. New York, Springer, 2009, pp 213-217

4. Schneider K, Zelle K, Nichols KE, et al: Li-Fraumeni Syndrome. In GeneReviews. Edited by RA Pagon, MP Adam, HH Ardinger, et al: University of Washington, Seattle. 1993-2014. 1999 Jan 19 (Updated 2013 Apr 11). Available at www.ncbi.nlm.nih.gov/books/NBK1311/

Performance

Method Description

Bi-directional sequence analysis is performed to test for the presence of a mutation in exons 1 through 11 of the *TP53* gene.(Unpublished Mayo method)

Additionally, array comparative genomic hybridization (aCGH) is used to test for the presence of large deletions and duplications.(Aradhya S, Lewis R, Bonaga T, et al: Exon-level array CGH in a large clinical cohort demonstrates increased sensitivity of diagnostic testing for Mendelian disorders. *Genet Med* 2012;14[6]:594-603)

PDF Report

No

Day(s) and Time(s) Test Performed

Performed weekly, varies

Analytic Time

14 days

Maximum Laboratory Time

20 days

Specimen Retention Time

Whole Blood: 2 weeks (if available) Extracted DNA: 3 months

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact [Customer Service](#).

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

81405-*TP53* (tumor protein 53) (eg, Li-Fraumeni syndrome, tumor samples), full gene sequence or targeted sequence analysis of >5 exons

Hereditary Colon Cancer CGH Array

81228-Cytogenomic constitutional (genome-wide) microarray analysis; interrogation of genomic regions for copy number variants (eg, Bacterial Artificial Chromosome [BAC] or oligo-based comparative genomic hybridization [CGH] microarray analysis)

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
TP53Z	TP53 Gene, Full Gene Analysis	94217-7

Result ID	Test Result Name	Result LOINC Value
52544	Result Summary	50397-9
52545	Result	82939-0
52546	Interpretation	69047-9
52547	Additional Information	48767-8
52548	Specimen	31208-2
52549	Source	31208-2
52550	Array Billed?	No LOINC Needed
52551	Released By	18771-6